

Derek W. Bailey

Animal & Range Sciences Dept. ~ New Mexico State University ~ Box 30003, MSC 3-I ~
Las Cruces, NM 88003-8003
(575) 646-2554 ~ FAX (575) 646-5441 ~ Email: dwbailey@nmsu.edu

EDUCATION

B.S.	Colorado State University	Animal Science	1980
M.S.	Colorado State University	Animal Science	1985
Ph.D.	Colorado State University	Range Science	1988

PROFESSIONAL EXPERIENCE

2010-present	Professor <i>(45% Research, 40% Teaching, 15% Administration)</i>	New Mexico State University	Las Cruces, NM
2005–2010	Associate Professor <i>(45% Research, 40% Teaching, 15% Administration)</i>	New Mexico State University	Las Cruces, NM
2002-2004	Associate Professor <i>(100% Research)</i>	Montana State University – Bozeman	Havre, MT
1996-2002	Assistant Professor <i>(100% Research)</i>	Montana State University – Bozeman	Havre, MT
1995-1996	Extension Agent	University of Arizona	Globe, AZ
1994-1995	Scientist-Ecologist	USDA-ARS	Woodward, OK
1988-1993	Consultant	Western Range Service	Elko, NV

COURSES TAUGHT

RGSC 452 Vegetation Measurements for Rangeland Assessment. Undergraduate vegetation monitoring course. Focus on cover, frequency, density, production and utilization. Sampling theory and analysis. (4 credits)

RGSC 458 Livestock Behavior, Welfare and Handling. Undergraduate course developed by Bailey during Spring 2009. Principles of animal behavior and evaluation of management systems on animal welfare in confined and rangeland livestock operations. Low-stress livestock handling techniques. Design of livestock handling systems. (3 credits)

RGSC 460 Advanced Rangeland Management. Capstone undergraduate course in the NMSU Range Science program. Rangeland management planning; use of vegetation monitoring in decision making; stocking rate calculations; grazing systems; rangeland administration; economic analyses for rangeland improvements. (4 credits)

RGSC 509 Approaches to Rangeland Research. Graduate course. Techniques and methods of conducting rangeland and ecological research. Experimental design and statistical analyses. Proposal development. (3 credits)

RGSC 515 Range Graduate Seminar (1 credit)

ADMINISTRATION

- Director of the Chihuahuan Desert Rangeland Research Center 2005 to present
 - Range Science Program Coordinator 2009 to 2016
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PROFESSIONAL SERVICE

- Associate Editor, Rangeland Ecology and Management (2007 through 2009)
 - President (2014), New Mexico Section of the Society for Range Management
 - Chair, Undergraduate Education Accreditation Committee (2011) Society for Range Management
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INTERNATIONAL ACTIVITIES

- **China.** Invited Academic Exchange Trip to China at the Academy of Animal Science and Veterinary Medicine, Qinghai University; Qinghai Province, Xining, China – August 2009
 - **Jordan.** Co-PI (Range Scientist) with the NMSU Jordan Project. Visited Jordan 7 times during 2007 to 2010 to develop and evaluate rangeland restoration research projects and present educational workshops to local communities.
 - **Australia.** Invited 1.5 month trip to Australia in 2013. Awarded McMaster's Visiting Scientist Fellowship from CSIRO in 2008 which funded a 2-month trip to Australia. Collaborations with University of New England, CSIRO and Primary Industries scientists.
 - **Fulbright Senior Scholarship to Australia.** Award to conduct research in Australia for 4 months during 2017. Host institution is Central Queensland University. Provides travel and living expenses. Research focus: Use of GPS tracking and sensor technology to monitor livestock welfare on rangeland.
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RESEARCH EMPHASIS

Livestock grazing management; GPS-based animal tracking; rangeland livestock production; riparian area management; livestock-wildlife interactions; rangeland restoration.

FUNDING TO SUPPORT RESEARCH **\$1,535,185 total** *last 5 years presented*

- USDA Western SARE. **\$271,215** (2015 to 2018). Implementation of genetic selection for grazing distribution to make cattle grazing in the western US more sustainable. Bailey (PI) Collaborative effort with Colorado State University, University of California, Davis and University of Arizona
- New Mexico Agriculture Experiment Station Special Project. **\$40,000** (2015-2016).
- Integration of genetic markers in cattle selection to improve adaptability and grazing management in mountainous and extensive rangeland. Bailey (PI)
- New Mexico Rangeland Ecosystem Project. **\$16,100** (2012 to 2014). Can honey mesquite (*Prosopis glandulosa*) be used as a forage for livestock to enhance ecologic and economic sustainability on New Mexico rangelands? Bailey (PI)

Funding to Support Research (last 5 years) continued

- USDA AFRI Managed Ecosystems. **\$363,040** (2010 to 2014). Integrated approaches for targeting cattle grazing to improve ecosystem services. Collaborative effort of NMSU, Colorado State University and University of Arizona. Bailey (PI)
- USDA Western SARE. **\$229,527** (2010 to 2013). Enhancement of sustainable livestock grazing through selection and training. Collaborative effort with University of Arizona. Bailey (PI)

PUBLICATIONS

Refereed Book Chapters (n = 3)

- Polley, H. W., **D.W. Bailey**, R.S. Nowak, and M. Stafford-Smith. 2017. Ecological consequences of climate change on rangelands. In: D.D. Briske [ED.]. Rangeland systems: processes: management, and challenges. Cham Switzerland: Springer Open. p. 229-260.
- **Bailey, D.W.** Grazing and animal distribution. 2016. In: J.J. Villalba and X Manteca [EDS.]. Animal welfare in extensive systems. Sheffield, UK: 5M Publishing. p. 53-77.
- **Bailey, D.W.** and F.D. Provenza. 2008. Mechanisms determining large-herbivore distribution. In: H. H. T. Prins and F. van Langevelde [EDS.]. Resource ecology: spatial and temporal dynamics of foraging. Dordrecht, Netherlands: Springer. p. 7-28.

Refereed Scientific Journal Publications (n = 51)

Last 5 years

- Smythe, B.G., S. Urias, M.E. Wise, E.J. Scholljegerdes, A.F. Summers, and **D.W. Bailey**. 2017. Comparing visual and digital counting methods to estimate horn fly (*Diptera: muscidae*) populations on cattle. *Journal of Medical Entomology*. doi: 10.1093/jme/tjw248
- Stephenson, M. B., **D. W. Bailey**, R. A. Bruegger, and L. D. Howery. 2017. Factors affecting the efficacy of low-stress herding and supplement placement to target cattle grazing locations. *Rangeland Ecology & Management* 70:202-209.
- **Bailey, D. W.**, M. G. Thomas, T. N. Holt, M. B. Stephenson, R. M. Enns, and S. E. Speidel. 2016. Relationship of pulmonary arterial pressure and terrain use of Angus cows grazing high-altitude foothill rangelands. *Livestock Science* 190:76-80.
- Bruegger, R.A., L.A. Varelas, L.D. Howery, L.A. Torell, M.B. Stephenson, and **D.W. Bailey**. 2016. Targeted grazing in southern Arizona: using cattle to reduce fine fuel loads. *Rangeland Ecology & Management* 69:43-51
- Pittarello, M, M. Probo, M. Lonati, **D.W. Bailey**, and G. Lombardi. 2016. Effects of traditional salt placement and strategically placed mineral mix supplements on cattle distribution in the Western Italian Alps. *Grass and Forage Science* 71:529-539.
- Stephenson, M.B., **D.W. Bailey**, and D. Jensen. 2016. Association patterns of visually-observed cattle on Montana, USA foothill rangelands. *Applied Animal Behaviour Science* 178:7-15.
- Stephenson, M. B., **D. W. Bailey**, L. D. Howery, and L. Henderson. 2016. Efficacy of low-stress herding and low-moisture block to target cattle grazing locations on New Mexico rangelands. *Journal of Arid Environments* 130:84-93.

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- **Bailey, D.W.**, S. Lunt, A. Lipka, M.G. Thomas, J.F. Medrano, A. Cánovas, G. Rincon, and M.B. Stephenson. 2015. Genetic influences on cattle grazing distribution: Association of genetic markers with terrain use in cattle. *Rangeland Ecology and Management* 68:142-149.
- **Bailey, D.W.**, M.B. Stephenson, and M. Pittarello. 2015. Effect of terrain heterogeneity on feeding site selection and livestock movement patterns. *Animal Production Science* 55:298-308.
- Briske, D.D., L.A. Joyce, H.W. Polley, J.R. Brown, K. Wolter, J. A. Morgan, B.A. McCarl, and **D.W. Bailey**. 2015. Geographic specificity and heterogeneous adaptive capacity as interacting components of climate change adaptation. *Frontiers in Ecology and the Environment* 13:249-256
- Thomas, M.G., A.H. Mohamed, M.N. Sawalhah, J.L. Holechek, **D.W. Bailey**, J.M. Hawkes, and P. Luna-Nevarez. 2015. Long term forage and cow-calf performance and economic considerations of two stocking levels on Chihuahuan Desert rangeland. *Rangeland Ecology and Management* 68:158-165.
- Markus, S.B., **D.W. Bailey** and D. Jensen. 2014. Comparison of electric fence and a simulated fenceless control system on cattle movements. *Livestock Science* 170:203-209.
- Probo, M., M. Lonati, M. Pittarello, **D.W. Bailey**, M. Garbarino, A. Gorlier and G. Lombardi. 2014. Implementation of a rotational grazing system with large paddocks changes the distribution of grazing cattle in the south-western Italian Alps. *Rangeland Journal* 36: 445-458.
- Al-Tabini, R., **D.W. Bailey**, K. Al-Khalidi, and M. Shodiatfat. 2014. Preferences of sheep, when supplemented, for forages in a Mediterranean rangeland management system. *Rangeland Journal* 36:35-39.
- Dobos, R.C., S. Dickson, **D.W. Bailey**, and M.G. Trotter. 2014. The use of GNSS technology to identify lambing behaviour in pregnant grazing Merino ewes. *Animal Production Science* 54:1722-1727.
- Joyce, L.A., D.D. Briske, J.R. Brown, H.W. Polley, B.A. McCarl, and **D.W. Bailey**. 2013. Climate change and North American rangelands: assessment of mitigation and adaptation strategies. *Rangeland Ecology and Management* 66:512–528.
- Polley, H.W., D.D. Briske, J.A. Morgan, K. Wolter, **D.W. Bailey**, and J.R. Brown. 2013. Climate change and North American rangelands: Evidence, trends, and implications. *Rangeland Ecology and Management* 66:493–511.
- Probo, M., A. Massolo, M. Lonati, **D.W. Bailey**, A. Gorlier, L. Maurino, and G. Lombardi. 2013. Use of mineral mix supplements to modify the grazing patterns by cattle for the restoration of sub-alpine and alpine shrub-encroached grasslands. *Rangeland Journal* 35:85-93.
- Russell, M.L., **D.W. Bailey**, M.G. Thomas, and B.K. Witmore. 2012. Grazing distribution and diet quality of Angus, Brangus and Brahman Cows in the Chihuahuan Desert. *Rangeland Ecology and Management* 65:371-381.

Other selected journal articles

- **Bailey, D.W.** and J.R. Brown. 2011. Rotational grazing systems and livestock grazing behavior in shrub-dominated semi-arid and arid rangelands. *Rangeland Ecology and Management* 64:1-9.
- **Bailey, D.W.**, M.G. Thomas, J.W. Walker, B.K. Witmore, and D. Tolleson. 2010. Effect of previous experience on grazing patterns and diet selection of Brangus cows in the Chihuahuan Desert. *Rangeland Ecology and Management* 63:223-232.
- **Bailey, D.W.** and D. Jensen. 2008. Method of supplementation may affect cattle grazing patterns. *Rangeland Ecology and Management* 61:131-135.

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- **Bailey, D.W.**, H.C. VanWagoner, R. Weinmeister, and D. Jenson. 2008. Evaluation of low-stress herding and supplement placement for managing cattle grazing in riparian and upland areas. *Rangeland Ecology and Management* 61:26-37.
- **Bailey, D.W.**, H.C. VanWagoner, R. Weinmeister, and D. Jenson. 2008. Comparison of low-moisture blocks and salt for manipulating grazing patterns of beef cows. *Journal of Animal Science* 86:1271-1277.
- Goulart, R.C.D., M. Corsi, **D.W. Bailey**, and S.S. Zocchi. 2008. Cattle grazing distribution and efficacy of strategic mineral mix placement in tropical Brazilian pastures. *Rangeland Ecology & Management* 61:656-660.
- **Bailey, D.W.**, H.C. VanWagoner, and R. Weinmeister. 2006. Individual animal selection has the potential to improve uniformity of grazing on foothill rangeland. *Rangeland Ecology and Management* 59:351-358.
- VanWagoner, H.C., **D.W. Bailey**, D.D. Kress, D.C. Anderson, and K.C. Davis. 2006. Differences among beef sire breeds and relationships between terrain use and performance when daughters graze foothill rangelands as cows. *Applied Animal Behaviour Science* 97:105-121.
- **Bailey, D.W.** 2005. Invited synthesis paper: Identification and creation of optimal habitat conditions for livestock. *Rangeland Ecology and Management* 58:109-118.
- Haley, D.B., **D.W. Bailey**, and J.M. Stookey. 2005. The effects of weaning calves in two stages on their behavior and growth rate. *Journal of Animal Science* 83:2205-2214.
- **Bailey, D.W.** 2004. Management strategies for optimal grazing distribution and use of arid rangelands. *Journal of Animal Science* 82(E. Suppl.):E147-E153.
- **Bailey, D.W.**, M.R. Keil, and L.R. Rittenhouse. 2004. Daily movement patterns of hill climbing and bottom dwelling cows. *Journal of Range Management* 57:20-28.
- **Bailey, D.W.**, D.D. Kress, D.C. Anderson, D.L. Boss, and E.T. Miller. 2001. Relationship between terrain use and performance of beef cows grazing foothill rangeland. *Journal of Animal Science* 79:1883-1891.
- **Bailey, D.W.**, G.R. Welling, and E.T. Miller. 2001. Cattle use of foothills rangeland near dehydrated molasses supplement. *Journal of Range Management* 54: 338-347.
- **Bailey, D.W.**, B. Dumont, and M.F. WallisDeVries. 1998. Utilization of heterogeneous grasslands by domestic herbivores: theory to management. *Annales de Zootechnie* 47:321-333.
- **Bailey, D.W.** and P.L. Sims. 1998. Association of food quality and locations by cattle. *Journal of Range Management* 51:2-8.
- **Bailey, D.W.**, J.E. Gross, E.A. Laca, L.R. Rittenhouse, M.B. Coughenour, D.M. Swift, and P.L. Sims. 1996. Mechanisms that result in large herbivore grazing distribution patterns. *Journal of Range Management* 49:386-400.
- **Bailey, D.W.** 1995. Daily selection of feeding areas by cattle in homogeneous and heterogeneous environments. *Applied Animal Behaviour Science* 45:183-199.
- **Bailey, D.W.**, J.W. Walker, and L.R. Rittenhouse. 1990. Sequential analysis of cattle location: day-to-day movement patterns. *Applied Animal Behaviour Science* 25: 137-148.
- **Bailey, D.W.**, L.R. Rittenhouse, R.H. Hart, and R.W. Richards. 1989. Characteristics of spatial memory in cattle. *Applied Animal Behaviour Science* 23:331-340.
- Senft, R.L., M.B. Coughenour, **D.W. Bailey**, L.R. Rittenhouse, O.E. Sala, and D.M. Swift. 1987. Large herbivore foraging and ecological hierarchies. *BioScience* 37:789-799.

Selected Reviewed Publications (n = 14)

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- **Bailey, D.W.**, M.B. Stephenson, M.G. Thomas, J.F. Medrano, and G. Rincon. 2013. Manipulation of the spatial grazing behavior of livestock in extensive grassland systems. In: D.L. Michalk, G.D. Millar, W.B. Badgery, and K.M. Broadfoot (EDS.) Revitalizing Grasslands to Sustain our Communities, Proceedings of the XXII International Grasslands Congress, September 15–19, 2013, Sydney, Australia. pp 614-616.
- **Bailey, D.W.** and M. Stephenson. 2013. Integrating stockmanship into rangeland management. *Stockmanship Journal* 2(1):1-12.
- Tanaka, J. A., N. R. Rimbey, L. A. Torell, D. Taylor, **D. Bailey**, T. DelCurto, K. Walburger, and B. Welling. 2007. Grazing distribution: The quest for the silver bullet. *Rangelands* 29(4):38-46.
- George, M., **D. Bailey**, M. Borman, D. Ganskopp, G. Surber, and N. Harris. 2007. Factors and practices that influence livestock distribution. University of California ANR Rangeland Management Series Pub. 8217, 20 p. Available at <http://anrcatalog.ucdavis.edu/pdf/8217.pdf> (accessed 31 January 2007).
- Wyman, S., **D.W. Bailey**, M. Borman, S. Cote, J. Eisner, B. Leinard, S. Leonard, F. Reed, S. Swanson, L. Van Riper, T. Westfall, R. Wiley, and A. Winward. 2006. Riparian area management: Grazing management processes and strategies for riparian-wetland areas. Technical Reference TR 1737-20. BLM/ST/ST-06/002+1737. U.S. Department of Interior, Bureau of Land Management, National Science and Technology Center, Denver, CO. 105 p.

Selected Proceedings (n = 28)

- **Bailey, D.W.**, M. Stephenson, M.G. Thomas, J.F. Medrano, G. Rincon, A. Cánovas, S. Lunt, and A. Lipka. 2013. Manipulation of the spatial grazing behaviour of cattle in extensive and mountainous rangelands. 17th International Meeting of the FAO-CIHEAM Mountain Pasture Network; Trivero, Italy, 4 p. <http://fao13.adcf.ch/outcomes.php>
- **Bailey, D.W.**, S. Marta, D. Jensen, D.L. Boss, and M.G. Thomas. 2010. Genetic and environmental influences on distribution patterns of beef cattle grazing foothill rangeland. *Proc., West. Sec. Amer. Soc. Anim. Sci.* 61:64-66.
- **Bailey, D.W.**, H.C. Van-Wagoner, D. Jensen, D.L. Boss, and M.G. Thomas. 2010. Relationship of temperament at calving and distribution of beef cows grazing foothill rangeland. *Proc., West. Sec. Amer. Soc. Anim. Sci.* 61:109-112.

Thesis

- **Bailey, D.W.** 1988. Characteristics of spatial memory and foraging behavior in cattle. Ph.D. Diss. Colorado State Univ., Fort Collins.
- **Bailey, D.W.** 1985. Genetic parameters of reproductive traits in beef cows. M.S. Thesis, Colorado State Univ., Fort Collins.